

a terminal having a base plate including a bore with an internal thread of a first axial length;

34 a screw having a shank with opposite first and second ends and with an external thread of a second axial length threadedly mating with said internal thread, and having a head on said first end of said shank, said second end of said shank being planar and circular, said second axial length being substantially greater than said first axial length; and

a stake formed in and extending along a chord of said second end transverse to the longitudinal axis of said shank, said stake creating a deformed portion of said external thread having a reduced width between adjacent crests thereof relative to other portions of said external thread, said deformed portion of said external thread forming a stop which does not threadedly mate with said internal thread.

REMARKS

Prior to the June 25, 2001 Office Action, claims 1, 4-16 and 18 were pending, with claims 1, 11 and 16 being independent. The specification and claims 1 and 11 have been objected to for informalities and claims 1, 4-16 and 18 have been rejected over a cited patent.

By this Amendment, claims 1, 4 and 11 are amended.

Reconsideration and allowance of the above-identified application is respectfully requested.

Objections to the Specification

In the Action the disclosure is objected to for informalities. As noted above, the specification has been amended to obviate these objections.

Objections to the Claims

In the Action, claims 1 and 11 are objected to because of alleged informalities. Specifically, the Action states that in claim 1, line 5, the phrase --in cross section-- should be added after "circular", and in claim 11, lines 6 and 7, "and circular" should be --and having a circular cross section--. Applicants respectfully disagree.

In claims 1 and 11, the second end of the shank is recited as "being circular and substantially planar". A cross section through the shank at the end surface perpendicular to the shank longitudinal axis, as apparently suggested in the Action, would not be circular. The cross section through the end of the shank and perpendicular to the longitudinal axis would extend through the stake and portions of threads, dividing the shank along the shank into two non-circular geometric figures. A cross section through the shank in a plane including the longitudinal axis would be generally rectangular with deviations for the shank and threads.

Therefore, Applicants request that this objection be withdrawn, since the proposed addition of -- in cross section -- would render the claims indefinite and inaccurate.

Rejections Under 35 USC § 103

Claim 1 covers a terminal assembly 10, comprising a terminal base 12 having a bore 38 with an internal thread 39 and a screw 14 having a shank 44 with opposite first and second ends. The screw also has an external thread 50, and a head 46 on the first end of the shank. The second end 52 of the shank is circular and substantially planar. A deformation 56 is in a portion of the external thread adjacent the second end of the shank. The deformation is a stake 54 formed in the second end of the shank and extending along a chord of the second end transverse to the longitudinal axis of the shank, whereby the deformation limits removal of the screw from the bore.

Claim 11 covers a terminal assembly 10, having a terminal 12 with and a screw 14. The terminal has an internal thread 39 of a first axial length. The screw has a shank 44 with an external thread 50 of a second axial length threadedly mating with the internal thread of the terminal. The second end of the shank is planar and circular. The second axial length is substantially greater than the first axial length. Similarly to claim 1, a stake 54 is formed in and extends along a chord of the second end transverse to the longitudinal axis of the shank. The stake creates a deformed portion 56 of the external thread having a reduced width between adjacent crests thereof relative to other portions of the external thread. The deformed portion of the external thread forms a stop which does not threadedly mate with the internal thread.

By forming the terminal assembly as recited in independent claims 1 and 11, the stake deforms the threads to act as a stop to limit the degree of screw removal from the bore in a simple and effective manner. Furthermore, since the stake is along the second end, there is a minimum disruption of threads and a maximum use of the non-deformed threads, allowing the screw to be backed out to its maximum extent without it becoming disengaged from the terminal base.

Claims 1, 4-16 and 18 stand rejected under 35 USC § 103(a) as being unpatentable over U.S. Patent No. 3,068,445 to Crowther.

Crowther is cited as teaching a terminal assembly 10 comprising a terminal base 12 having a bore 18 with an internal thread and a screw 16 having a shank 24 with opposite first and second ends and with an external thread 26. The screw allegedly has a head 22 on the first end, and a deformation 36 in a portion of the external thread adjacent the second end, forming a stop to limit removal of the screw from the bore. However, as admitted in the Action, Crowther does not disclose, teach or suggest a deformation being a stake. In support of the rejection, the Action

states that (1) Crowther discloses that the second end can be distorted by peening or other suitable means, (2) it would have been an obvious design choice to deform the second end of the shank with a stake, since applicants have not disclosed that the use of a stake solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the deformation as taught by Crowther, and (3) a deformation made with a wedge-shaped peen will extend along a chord of the second end, since the purpose is to deform the threads, therefore reducing the width between adjacent crests of the external threads.

Applicants respectfully disagree. Clearly, Crowther does not disclose, teach or suggest all of the elements of amended independent claim 1 or 11. As admitted in the Action, Crowther does not disclose or render obvious a stake formed in the second end of the shank and extending along a chord of the second end of the shank. Furthermore, amended independent claims 1 and 11 recite that the stake is transverse the longitudinal axis, which is not taught by the Crowther patent. As noted in column 2, lines 27-29 of the Crowther patent, the last thread on the screw can be distorted by peening. By peening the screw in this manner, the threads of the screw are distorted along or parallel to the longitudinal axis of the screw. This peening apparently distorts all of the last thread of the screw, requiring multiple applications of a peening tool. This circumferentially extended deformed portion will likely extend farther along the axial length of the screw shank than if the end of the shank is deformed as recited in claims 1 and 11. By peening the screw as taught in the Crowther patent, less of the screw can be used or backed out of the screw hole than would be available if the screw were deformed along the end as recited in claims 1 and 11.

Additionally, the claimed stake is quicker and easier to form. Therefore, it would not have been an obvious design choice to form the stake as recited in claim 1, since Applicants have disclosed

that the use of a stake solves stated problems, namely increasing the useful length of the screw shank and facilitating formation.

Accordingly, claims 1 and 11 are patentably distinguishable over the cited patent.

Claims 4-9 and 12-15 being dependent on claims 1 and 11, respectively, are also allowable for the above reasons. Moreover, these dependent claims recite additional features further distinguishing them over cited patent. For example, claim 4 recites that the stake is offset from and extends perpendicular to the longitudinal axis of the shank. Claim 5 recites that the portion of the external thread forming the deformation has a reduced width between adjacent crests thereof relative to other portions of the external thread. Claims 6 and 12 recite that a backing plate has a central aperture receiving the shank and is positioned between the head and the terminal base. Claims 7 and 13 recite that the backing plate comprises a depending tab, and the terminal base comprises an opening slidably receiving the tab. Claims 8 and 14 recite that the backing plate comprises depending first and second tabs on opposite side edges thereof, and the terminal base comprises first and second openings slidably receiving the first and second tabs, respectively. Claims 9 and 15 recite that the terminal base comprises a contact extending therefrom. Claim 10 recites that the external thread has an axial length substantially greater than an axial length of the internal thread.

With regard to the rejection of independent claim 16, it is noted that claim 16 covers the method of forming a terminal assembly similar to the terminal assembly recited in claims 1 and 11. However, claim 16 specifically recites, among other things, that the stake is formed on the second end along a line extending across the second end and offset from and perpendicular to a longitudinal axis of the shank. As discussed above, this formation of the stake along the second

end allows the screw to be backed out farther than the conventional terminal assemblies, resulting in more usable threads than in the cited prior art.

Applicants submit that claim 16 is allowable over the Crowther patent for at least the same reasons as discussed above for claims 1 and 11.

Claim 18 being dependent on claim 16 is also allowable for the above reasons. Moreover, this dependent claim recites additional features further distinguishing it over the cited patent. Specifically, claim 18 recites that the shank is placed within a central aperture of a backing plate before being threaded into the bore.

For at least the reasons set forth above applicants respectfully submit that claims 1, 4-16 and 18 are allowable. Prompt and favorable action is solicited.

Respectfully submitted,



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MARKED UP VERSION TO SHOW CHANGES

IN THE SPECIFICATION:

Replace the paragraph starting on page 6, line 23 with the following paragraph:

Screw 14 comprises a shank 44 with a head 46 at one end of the shank. The head is of conventional design with a screw driver receiving slot 48. Shank 44 has an external thread 50 which extends substantially its entire length from its adjacent head 46 to its opposite end 52. Thread 50 mates with internal thread 39 in bore [36] 38.

Replace the partial paragraph beginning on page 8, line 1 with the following paragraph:
without stake [56] 54, is then threaded into bore 38 to a point of its maximum backout dimension. Such backout dimension corresponds to a spacing between head 46 and base plate 20 which allows tabs 60 and 62 to at least be partially received within openings 40 and 42 to restrain rotation of the backing plate relative to the terminal base. In this position, stake [56] 54 is then formed by punching in end 52 of shank 44. The formation of the stake 54 creates deformation or deformed portion 56 in external thread 50 to limit the amount the screw can be backed out of the terminal base bore.

IN THE CLAIMS

Amend claims 1 and 11 as follows:

1. A terminal assembly, comprising:
a terminal base having a bore with an internal thread;
a screw having a shank with opposite first and second ends and with an external thread, and having a head on said first end of said shank, said second end of said shank being circular and substantially planar; and

a deformation in a portion of said external thread adjacent said second end of said shank, said deformation being a stake formed in said second end of said shank and extending along a chord of said second end transverse to the longitudinal axis of the shank;

whereby said deformation limits removal of said screw from said bore.

4. A terminal assembly according to claim 1 wherein

said stake is offset from and extends perpendicular to [a] the longitudinal axis of said shank.

11. A terminal assembly, comprising:

a terminal having a base plate including a bore with an internal thread of a first axial length;

a screw having a shank with opposite first and second ends and with an external thread of a second axial length threadedly mating with said internal thread, and having a head on said first end of said shank, said second end of said shank being planar and circular, said second axial length being substantially greater than said first axial length; and

a stake formed in and extending along a chord of said second end transverse to the longitudinal axis of said shank, said stake creating a deformed portion of said external thread having a reduced width between adjacent crests thereof relative to other portions of said external thread, said deformed portion of said external thread forming a stop which does not threadedly mate with said internal thread.